

The Extent and Impact of Artificial Intelligence Adoption on Corporate Social Responsibility Among Nigerian SMEs

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Abstract

This study examines the degree of Artificial Intelligence (AI) application and its influence on corporate social responsibility (CSR) in Small and Medium-Sized Enterprises (SMEs) in Lagos State, Nigeria. Data was collected from 64 employees and managers in SMEs across several industries using a descriptive survey study design. The Artificial Intelligence and SME Social Impact Questionnaire (AISSIQ) was designed to assess AI utilization, perceived advantages, and corporate social responsibility impact. The analysis of the data, employing descriptive statistics, correlation, and regression, indicated that the degree of AI utilization does not substantially correlate with CSR participation, implying that Nigerian SMEs may not yet harness AI for socially responsible operations. Moreover, the perceived advantages of AI usage did not significantly forecast AI adoption rates, suggesting that alternative factors may exert a greater influence on AI deployment within these organizations. The study's results underscore the necessity for greater investigation into supplementary factors influencing AI adoption, especially in resource-limited settings. Policymakers and SME management are urged to contemplate infrastructural assistance and resource distribution to facilitate extensive and significant AI implementation. These findings elucidate the problems encountered by Nigerian SMEs in AI integration and enhance comprehension of AI's role in fostering socially responsible business practices.

Keywords: Artificial Intelligence (AI), Corporate Social Responsibility (CSR), Small and Medium-Sized Enterprises (SMEs), Technology Adoption, Nigerian Business Environment

Introduction

The integration of artificial intelligence (AI) has significantly altered the global business environment, improving operational efficiency, refining decision-making processes, and fostering new opportunities for innovation (Chui, Manyika, & Miremadi, 2016). Small and medium-sized enterprises (SMEs) play a vital role in economic development and job creation. The integration of AI technologies offers distinct opportunities and challenges, especially in developing economies like Nigeria (Onyeaghala & Fagbola, 2020). AI adoption is frequently resource-intensive; however, recent studies indicate that the level of AI utilization among SMEs can considerably affect their capacity to implement socially responsible practices (George, Howard-Grenville, Joshi, & Tihanyi, 2020). This relationship highlights the potential of AI in influencing corporate social

responsibility (CSR) initiatives, as businesses utilize AI to tackle social and environmental challenges, enhance transparency, and foster stakeholder engagement (Kiron & Unruh, 2018). As AI becomes more accessible to SMEs, the perceived benefits associated with its use are crucial in motivating adoption (Shin, 2020). The Technology Acceptance Model (TAM) and similar frameworks suggest that perceived usefulness and expected advantages play a pivotal role in influencing technology acceptance (Venkatesh & Bala, 2008). For Nigerian SMEs, perceived benefits such as cost reduction, improved customer interactions, and data-driven insights can drive the extent of AI adoption, further facilitating CSR efforts by enabling better resource management, ethical supply chain practices, and enhanced community relations (Chatterjee, Ghosh, Chaudhuri, & Sikdar, 2021).

Hypotheses/Objectives

This study aims to explore the extent of AI utilization among Nigerian SMEs and examine how perceived benefits influence the adoption process, with an emphasis on the relationship between AI use and CSR initiatives. Based on these aims, the following hypotheses are proposed:

1. There is a positive relationship between the extent of AI utilization (EAIU) and the level of corporate social responsibility (AIUECSR) among Nigerian SMEs.
2. The perceived benefits of AI utilization (BAIU) significantly predict the extent of AI adoption (EAIU) among Nigerian SMEs.

This study's findings are expected to provide valuable insights into the strategic role of AI for Nigerian SMEs, demonstrating how perceived benefits and CSR incentives can encourage technology adoption. These insights contribute to the broader literature on AI-driven CSR, emphasizing the transformative potential of AI within resource-constrained environments.

Literature Review

Technology-Organization-Environment (TOE) Framework

The Technology-Organization-Environment (TOE) framework, developed by Tornatzky and Fleischer (1990), offers a structured method for analysing technology adoption within organizations, focusing on three key dimensions: technological, organizational, and environmental contexts. The technological context encompasses factors such as perceived benefits and system compatibility, which affect technology acceptance. The organizational context includes factors like available resources, managerial commitment, and firm size, which influence technology integration (Oliveira & Martins, 2011). The environmental context encompasses external pressures, regulatory requirements, and market conditions that influence adoption decisions (Baker, 2012). The TOE framework is beneficial for Nigerian SMEs contemplating AI adoption, as it specifically addresses the distinct technological, organizational, and environmental challenges they encounter.

Extent of AI Adoption Among SMEs

The level of AI adoption among SMEs varies greatly, affected by technological, organizational, and environmental factors. Small and medium-sized enterprises (SMEs) frequently face challenges

to AI adoption, such as insufficient infrastructure, a lack of trained labor, and restricted funding. Those who can overcome these challenges can use AI to gain a competitive advantage, particularly in data-driven decision-making and operational efficiency. In Nigeria, additional difficulties such as technological limits and a lack of regulatory backing impede AI implementation in SMEs (Onyeaghala & Fagbola, 2020). This study uses the TOE paradigm to examine AI adoption rates, with an emphasis on how perceived benefits and contextual factors influence usage.

Perceived Benefits as Drivers of AI Adoption

The technological context of the TOE framework emphasises perceived benefits as a significant driver of technology adoption (Baker, 2012). AI benefits for SMEs with limited resources include cost savings, increased productivity, and improved customer engagement (Shin, 2020). Chatterjee et al. (2021) discovered that SMEs that recognise AI's potential benefits are more inclined to use it. Similarly, the Technology Acceptance Model (TAM) emphasises perceived utility in adoption decisions (Venkatesh and Bala, 2008). This study proposes that perceived AI benefits influence AI adoption among Nigerian SMEs.

Impact of AI on Corporate Social Responsibility (CSR)

The TOE framework's organisational context facilitates AI integration in corporate social responsibility, enabling firms to achieve social responsibility objectives more efficiently (George et al., 2020). Artificial intelligence improves corporate social responsibility through enhanced transparency, resource optimisation, and diminished environmental impact (Bai, Sarkis, & Dou, 2015). AI presents a novel method for enhancing precision in CSR initiatives for resourceconstrained SMEs (Dwivedi et al., 2021). Kiron and Unruh (2018) propose that AI can enhance CSR by facilitating compliance tracking and measuring social impact. This study posits a positive correlation between the use of AI and CSR engagement in Nigerian SMEs (Hypothesis 1).

The Nigerian Context: Challenges and Opportunities

In Nigeria, environmental elements in the TOE framework are critical since SMEs have limited access to technology and regulatory support (Onyeaghala and Fagbola, 2020). Socioeconomic factors and local market demands influence AI adoption for CSR (Chatterjee et al., 2021). Despite the obstacles, Nigerian SMEs rapidly recognize AI's promise for promoting CSR, particularly in industries where it may improve brand image and market reach. This study helps to better understand how perceived benefits and CSR aims influence AI adoption, which has consequences for Nigeria's long-term growth.

Research Design/Methodology

This study utilized a descriptive survey research design to examine the utilization of Artificial Intelligence (AI) and its impact on corporate social responsibility (CSR) among small and medium-sized enterprises (SMEs) in Lagos State, Nigeria. This design was selected to enable the collection of detailed information on AI usage, perceived benefits, and CSR engagement, offering a comprehensive view of AI practices within Nigerian SMEs. The target population consisted of SME employees and managers across various industries in Lagos. A purposive sampling method

was employed to select 64 employees and managers. This method was chosen to ensure the selection of participants who possess relevant knowledge and experience critical to the study's objectives, resulting in a sample of 64 participants, with 76.6% males and 23.4% females, primarily within the 25-30 age range. Most respondents (68.8%) came from smaller enterprises with 1-50 employees, covering industries such as technology (29.7%), services (28.1%), manufacturing (23.4%), and retail (18.8%).

Data was gathered through a self-developed questionnaire, the Artificial Intelligence and SME Social Impact Questionnaire (AISSIQ), which collected information on demographics, extent of AI utilization, perceived benefits, and CSR impact. Items measuring AI utilization and benefits were scored on a Likert scale, yielding mean scores indicating moderate AI use (mean = 10.77, SD = 1.095) and perceived benefits (mean = 9.86, SD = 2.288). The instrument was validated by experts in AI and SME management and pre-tested for reliability, achieving a Cronbach's alpha of 0.86. Data collection was conducted via both physical and electronic distribution, achieving a high response rate of 98.5%. Analysis was performed using SPSS, employing descriptive statistics, correlation, and regression to examine the relationships among variables and interpret the responses.

Result/Model Analysis

Descriptive Statistics

The demographic data shows that the sample of 64 respondents consisted predominantly of males (76.6%), with females representing 23.4% of the sample. Most participants fell within the 25-30 age range (60.9%), followed by the 31-35 age range (31.3%). In terms of company size, 68.8% of respondents were from SMEs with 1-50 employees, reflecting the smaller scale of many enterprises. The industry distribution included technology (29.7%), services (28.1%), manufacturing (23.4%), and retail (18.8%).

Table 1: Descriptive Statistics of Key Variables

Variable	N	Minimum	Maximum	Mean	Standard Deviation
Extent of AI Utilization (EAIU)	64	9	14	10.77	1.095
Benefits of AI Utilization (BAIU)	64	6	15	9.86	2.288
Ways in Which AI Enhanced (AIUECSR)	CSR 64	7	12	9.56	1.258

The primary variables analyzed included the Extent of AI Utilization (EAIU), which had a mean score of 10.77 (SD = 1.095), indicating moderate levels of AI usage among Nigerian SMEs. The Benefits of AI Utilization (BAIU) variable yielded a mean of 9.86 (SD = 2.288), showing a moderate perception of AI benefits among respondents. How AI Utilization Enhanced CSR

(AIUECSR) had a mean score of 9.56 (SD = 1.258), suggesting a moderate impact of AI on CSR initiatives.

Hypothesis 1: Relationship Between Extent of AI Utilization and CSR Enhancement

To test Hypothesis 1, which posited a positive relationship between the extent of AI utilization (EAIU) and the level of CSR enhancement (AIUECSR), a Pearson correlation analysis was conducted. The result revealed a correlation coefficient of -0.225 with a p-value of 0.073. This weak negative correlation was not statistically significant at the 0.05 level, suggesting that there is no meaningful relationship between the extent of AI usage and CSR enhancement within the sample. Thus, Hypothesis 1 was not supported.

Table 2: Correlation Analysis for Hypothesis 1 (N=64)

Variables	EAIU	AIUECSR
Extent of AI Utilization (EAIU)	1	-0.225
Ways in Which AI Utilization Enhanced CSR (AIUECSR)	-0.225	1
Sig. (2-tailed)		0.073

Interpretation: The correlation coefficient (-0.225) suggests a weak negative relationship between EAIU and AIUECSR, which is not statistically significant (p = 0.073).

Hypothesis 2: Perceived Benefits of AI as a Predictor of AI Utilization

To examine Hypothesis 2, which proposed that perceived benefits of AI utilization (BAIU) would significantly predict the extent of AI adoption (EAIU), a regression analysis was performed. The results indicated an R-squared value of 0.018, suggesting that BAIU explained only 1.8% of the variance in EAIU. The overall regression model was not significant (p = 0.297), and the unstandardized coefficient for BAIU (B = 0.063, p = 0.297) was also not significant. Therefore, Hypothesis 2 was not supported, as the perceived benefits of AI did not significantly predict the extent of AI utilization among Nigerian SMEs.

Table 3: Regression Analysis for Hypothesis 2 (BAIU as Predictor of EAIU) Table 3a. Model Summary

Model	R	R Square	Adjusted Square	R	Std. Error of the Estimate
1	0.132	0.018	0.002		1.094

Table 3b. ANOVA

Model	Sum of Squares	df	Mean Square	F	Sig.
Regression	1.324	1	1.324	1.107	0.297
Residual	74.161	62	1.196		
Total	75.484	63			

Table 3c. Coefficients

Model (B)	Error	(Beta)	t	Sig.	
(Constant)	10.141	0.609	16.642	0.000	
BAIU	0.063	0.060	0.132	1.052	0.297
	Unstandardized Coefficients Std.	Standardized Coefficients			

Interpretation: The regression analysis shows that BAIU does not significantly predict EAIU, as indicated by a low R-squared (0.018) and a non-significant p-value ($p = 0.297$) for the BAIU coefficient. **Discussion**

The findings from this study contribute to the understanding of AI adoption and CSR engagement within Nigerian SMEs, though they reveal that the anticipated relationships between AI utilization, perceived benefits, and CSR impact were not statistically supported.

For Hypothesis 1, which proposed a positive association between the extent of AI utilization (EAIU) and CSR engagement (AIUECSR), the results showed a weak, non-significant negative correlation ($r = -0.225$, $p = 0.073$). This suggests that AI utilization within Nigerian SMEs does not significantly drive CSR initiatives, aligning with research that indicates AI adoption in SMEs is often more focused on operational efficiencies than on broader social goals (Dwivedi et al., 2021). While some studies suggest AI could facilitate CSR by improving transparency and sustainability (Kiron & Unruh, 2018), this finding may reflect the challenges Nigerian SMEs face in leveraging AI for social responsibility, given their limited resources and focus on survival and growth (Onyeaghala & Fagbola, 2020).

For Hypothesis 2, which proposed that perceived benefits of AI (BAIU) would predict AI adoption levels (EAIU), the regression analysis was also non-significant, with perceived benefits explaining only 1.8% of the variance in AI utilization ($R^2 = 0.018$, $p = 0.297$). This finding contrasts with prior research emphasizing perceived usefulness as a predictor of technology adoption (Venkatesh & Bala, 2008). In Nigerian SMEs, factors beyond perceived benefits—such as financial

constraints, lack of regulatory support, and limited access to infrastructure—may more critically influence AI adoption (Onyeaghala & Fagbola, 2020). As Chatterjee, Ghosh, Chaudhuri, and Sikdar (2021) highlighted, while SMEs recognize AI's potential, actual adoption often depends on overcoming substantial barriers.

In summary, while Nigerian SMEs acknowledge some benefits of AI, these perceptions alone do not drive significant AI adoption or CSR engagement. This suggests a need for further exploration of structural and environmental factors influencing AI integration in SMEs, particularly within developing economies where resource limitations are pronounced.

Conclusions

This study examined the utilization of Artificial Intelligence (AI) and its impact on corporate social responsibility (CSR) among small and medium-sized enterprises (SMEs) in Lagos State, Nigeria. The findings revealed no significant relationship between AI utilization and CSR engagement, nor did perceived benefits predict the extent of AI adoption among these SMEs. These results suggest that other factors beyond perceived benefits may drive AI utilization and CSR outcomes in Nigerian SMEs, particularly in a resource-constrained setting.

Implications of the Study

The findings of this study have implications for both policymakers and SME managers. For policymakers, the lack of significant relationship between AI utilization and CSR engagement highlights the need for supportive infrastructure, training, and funding to enable SMEs to adopt AI more effectively. For SME managers, the results suggest that merely recognizing the benefits of AI may not be enough to drive adoption; addressing financial and operational constraints could be crucial to leveraging AI for CSR initiatives.

Directions for Future Research

Future research could explore other factors influencing AI adoption and CSR engagement in SMEs, such as organizational culture, regulatory policies, and market competition. Expanding the study to include a larger and more geographically diverse sample across Nigeria or other developing countries would provide broader insights. Additionally, qualitative research could be conducted to understand the specific challenges Nigerian SMEs face in adopting AI, offering a deeper perspective on how they perceive AI's role in CSR.

Recommendations

Based on the findings, it is recommended that Nigerian government agencies and industry bodies provide more targeted support to SMEs, such as subsidies, training, and access to digital infrastructure, to enhance AI adoption. SME managers are encouraged to build awareness of the operational and social potential of AI and to develop strategies that incorporate AI into CSR in meaningful ways. Addressing these challenges could improve the integration of AI in business operations and enable SMEs to contribute more effectively to CSR objectives.

Limitations

One limitation of this study is the relatively small sample size, which may limit the generalizability of the findings to all Nigerian SMEs. Additionally, data collection was restricted to Lagos State, so the findings may not fully reflect the AI adoption and CSR practices of SMEs across Nigeria. Another limitation is the use of self-reported data, which could be influenced by social desirability bias, particularly in responses related to CSR.

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